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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Charles Frank

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EXAMINER

DILLON, SAMUEL A

ART UNIT

PAPER NUMBER

2185

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/763,099

Applicant(s)

FRANK ET AL.

Examiner

SAMUEL DILLON

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-28, 30-41, 43 and 44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-28, 30-41, 43 and 44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's submission filed on February 23, 2009 has been entered. Per the amendment, Claims 29 and 42 have been cancelled, Claims 17, 23-25, 28, 30-36, 40 and 41 have been amended and Claim 44 has been added.

I. RESPONSE TO AMENDMENT(S) / ARGUMENT(S)

2. **Applicant's arguments with respect to the 35 U.S.C. 102(e) rejections of Claims 17-27, 40, 41 and 43 have been fully considered but they are *not persuasive*.** The rejections have been upheld, and the Applicant directed below for traversal.
3. Regarding Claims 17 and 40, the Applicant contends that Wang and Anderson fail to disclose numerous limitations that are listed as things the controller is configured to do. The Examiner respectfully notes that these limitations fall entirely within the claimed intended use of the claim, as the controller is "*configured to*" do them, but the claims do not positively recite the controller actually performing the steps. The Examiner notes that this interpretation was provided in the previous Office action and not responded to by the Applicant, and asserts that Wang is not specifically precluded from performing any of the claimed functionality.

A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See MPEP 2106 II (C).

4. **Applicant's arguments with respect to the 35 U.S.C. 102(e) rejections of Claims 28, 30-39 and 44 have been fully considered and are *persuasive*.** However, Applicant's arguments are moot in view of the new ground(s) of rejection, as described below.

5. Regarding all other Claims not specifically traversed above and whose rejections were upheld, the Applicant contends that the listed claims are allowable by virtue of their dependence on other allowable claims. As this dependence is the sole rationale put forth for the allowability of said dependent claims, the Applicant is directed to the Examiner's remarks above. Additionally, any other arguments the Applicant made that were not specifically addressed in this Office Action appeared to directly rely on an argument presented elsewhere in the Applicant's response that was traversed, rendered moot or found persuasive above.

II. REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC ' 102 - Wang

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. **Claims 17-27, 40, 41 and 43** are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (*US Patent 6,834,326*).

8. As per **Claim 17**, Wang disclose(s) a storage appliance comprising: a network interface (*RAID controller/switch, more specifically the switch functionality, figure 5*); a storage medium; and a controller coupled to the network interface and the storage medium (*RAID controller/switch, more specifically the RAID controller functionality, figure 5*) and **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) provide a root partition (*filesystem or virtual disk, column 8 lines 56-63*) on the storage medium, the root partition on the storage medium, the root partition defining a plurality of characteristics (*column 9 lines 13-42*) of a redundant

array (RA) group that includes a plurality of RA partitions (*RAID volumes, figure 5, column 8 lines 42-54*), **to** (*interpreted as intended use, see MPEP 2106 II[C]*) provide a RA partition on the storage medium, the RA partition being one of the plurality of RA partitions (*services a read request, column 8 lines 42-54*), **to** (*interpreted as intended use, see MPEP 2106 II[C]*) receive, via the network interface, a data access command multicast to the plurality of RA partitions (*column 8 lines 42-54*), and **to** (*interpreted as intended use, see MPEP 2106 II[C]*) determine that the data access command pertains to the RA partition based at least in part on the plurality of characteristics (*the controller/switch determines the underlying network, col 9 lines 13-22*).

9. As per **Claim 18**, Wang disclose(s) the storage appliance of **Claim 17**, wherein the controller is further **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) receive, via the network interface, a plurality of partition commands (*read requests of the nested controller, figure 6, column 8 lines 56-64*) from a host (*the parent controller, figure 6*); and **to** (*interpreted as intended use, see MPEP 2106 II[C]*) provide the root partition and the RA partition based at least in part on the plurality of partition commands (*servicing the read request to the parent controller, column 8 lines 56-64*).

10. As per **Claim 19**, Wang disclose(s) the storage appliance of **Claim 17**, wherein the plurality of characteristics includes a multicast set associated with the RA group (*column 9 lines 32-42*).

11. As per **Claim 20**, Wang disclose(s) the storage appliance of **Claim 19**, wherein the controller is **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) receive a multicast set command (*write command to the nested controller, figure 6*) from a host (*parent controller, figure 6*) via the network interface, and **to** (*interpreted as intended use, see MPEP 2106 II[C]*) establish the multicast set associated with the RA group based at least in part on the multicast set command (*writing to the controller will modify the controller's storage, figure 6*).

12. As per **Claim 21**, Wang disclose(s) the storage appliance of Claim 17, wherein the data access command is multicast to the plurality of RA partitions using an Internet Protocol address (column 8 lines 31-41).

13. As per **Claim 22**, Wang disclose(s) the storage appliance of Claim 17, wherein the controller is further **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) receive, via the network interface, another data access command multicast to the plurality of RA partitions (*write received and then multicast, column 12 lines 56-67*); **to** (*interpreted as intended use, see MPEP 2106 II[C]*) receive, via the network interface, a response to the another data access command (*multiack's are sent back in response, column 12 lines 56-67*); and **to** (*interpreted as intended use, see MPEP 2106 II[C]*) disregard the another data access command based at least in part on the response (column 12 lines 65-67).

14. As per **Claim 23**, Wang disclose(s) the storage appliance of Claim 17, wherein the plurality of characteristics includes a type of the RA group and a description of the plurality of RA partitions and the controller is further **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) determine that the data access command pertains to the RA partition based at least in part on the type of the RA group and the description of the plurality of RA partitions (column 9 lines 32-42).

15. As per **Claim 24**, Wang disclose(s) the storage appliance of Claim 23, wherein the type is a stripe and the plurality of characteristics further includes a length of the stripe (column 9 lines 32-35).

16. As per **Claim 25**, Wang disclose(s) the storage appliance of Claim 17, wherein the plurality of characteristics includes a parity rule (*RAID level includes parity, col. 9 lines 32-42*).

17. As per **Claim 26**, Wang disclose(s) the storage appliance of Claim 17, wherein the plurality of RA partitions are associated with a plurality of logical block addresses (LBAs) and

the controller is further **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) calculate, based at least in part on the plurality of characteristics of the RA group defined in the root partition, which LBAs of the plurality of LBAs are associated with the RA partition (*column 17, lines 47-54*).

18. As per **Claim 27**, Wang disclose(s) the storage appliance of Claim 17, wherein the controller is **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) receive the data access command from a host and the controller is further **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) transmit, via the network interface, data directly to another RA partition of the plurality of RA partitions based at least in part on the data access command (*standard NetSCSI, column 11 lines 63-67*).

19. As per **Claim 40**, Wang disclose(s) an apparatus comprising: a network interface (*RAID controller/switch, more specifically the switch functionality, figure 5*); and a controller (*RAID controller/switch, more specifically the RAID controller functionality, figure 5*) **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) transmit, via the network interface, a first partition command to establish a root partition on a storage medium (*column 9 lines 13-22, lines 32-42*); **to** (*interpreted as intended use, see MPEP 2106 II[C]*) transmit, via the network interface, a plurality of characteristics of a redundant array (RA) group, which includes a plurality of RA partitions, to be stored in the root partition (*column 9 lines 13-22, lines 32-42*); **to** (*interpreted as intended use, see MPEP 2106 II[C]*) transmit, via the network interface, a second partition command to establish a RA partition of the plurality of RA partitions, on the storage medium (*column 9 lines 13-22, lines 32-42*); and **to** (*interpreted as intended use, see MPEP 2106 II[C]*) multicast, via the network interface, a packet to the plurality of RA partitions, the packet having a data access command and a logical block address (LBA) to which the data

access command pertains, the LBA associated with only a subset of the plurality of RA partitions (*column 11 lines 63-67, column 17, lines 47-54*).

20. As per **Claim 41**, Wang disclose(s) the apparatus of **Claim 40**, wherein the controller is further **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) transmit a partition command to each of a plurality of storage appliances associated with a respective plurality of storage media to establish the plurality of RA partitions (*column 9 lines 13-22, lines 32-42*).

21. As per **Claim 43**, Wang disclose(s) the apparatus of **Claim 42**, wherein the controller is **configured to** (*interpreted as intended use, see MPEP 2106 II[C]*) multicast the packet by being configured to transmit the packet with a multicast Internet Protocol address (*col 11 lines 63-67*).

Claim Rejections - 35 USC ' 103 – Wang and Fye

22. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

23. **Claims 28, 30-39 and 44** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (*US Patent 6,834,326*) in view of Fye (*US Patent 5,983,024*).

24. As per **Claim 28**, Wang disclose(s) a method comprising: providing, on a storage medium, a root partition (*physical storage of a RAID volume on a disk, figure 5, column 8 lines 42-54*) associated with a redundant array (RA) group that includes a plurality of RA partitions, providing, on the storage medium, a RA partition of the plurality of RA partitions (*RAID volumes, figure 5, column 8 lines 42-54*), and receiving, via the network interface, a data access command multicast to the plurality of RA partitions (*figure 8e, column 8 lines 42-54*).

For the purposes of this rejection, Wang is not relied upon for disclosing the root partition having a plurality of characteristics, and determining that the data access command pertains to the RA partition based at least in part on the plurality of characteristics. Wang discloses multicasting write commands only to the memory devices that are associated with the write command (*figure 8e*).

Fye discloses multicasting write commands to all memory devices (*broadcasting*), and that the memory devices then listen (*snoop*) for commands that they are interested in (*column 2 lines 8-16*). More specifically, Fye discloses a root partition having a plurality of characteristics (*figure 2*), and determining that a data access command pertains to a partition based at least in part on the plurality of characteristics ("*When a broadcast transaction of interest is detected*", *column 2 lines 8-16*).

Wang and Fye are analogous art in that they deal with multicasting / broadcasting writes to multiple memory devices. At the time of the invention, it would have been obvious to a person having ordinary skill in the art to modify Wang to broadcast a write to all the memory devices, and then have each individual memory device determine if the write was relevant, as opposed to having the switch keep track of that information, per the teachings of Fye.

The motivation for doing so would have been that broadcasting and multicasting are two standard methodologies in networking, and the Examiner asserts that choosing one or the other would have been obvious because they are interchangeable methodologies with different benefits and strengths, are predictable and well known in the art. More specifically, broadcasting writes moves functionality from the switch to the memory devices, and therefore a possible motivation would be to require less functionality on the switch. Therefore, it would have been obvious to modify Wang as per the teachings of Fye for the benefit of moving functionality from the switch to the storage devices, to obtain the invention of Claim 28.

25. As per **Claim 30**, Wang and Fye disclose(s) the method of Claim 28, wherein the plurality of characteristics includes a multicast set associated with the RA group (*Fye, figure 2*).
26. As per **Claim 31**, Wang and Fye disclose(s) the method of Claim 28, wherein the data access command is multicast to the plurality of RA partitions using an Internet Protocol address (*Wang, column 8 lines 31-41*).
27. As per **Claim 32**, Wang and Fye disclose(s) the method of Claim 28, further comprising: receiving, via the network interface, another data access command multicast to the plurality of RA partitions (*Wang, write received and then multicast, column 12 lines 56-67*); receiving, via the network interface, a response to the another data access command (*Wang, multiack's are sent back in response, column 12 lines 56-67*); and disregarding the another data access command based at least in part on the received response (*Wang, column 12 lines 65-67*).
28. As per **Claim 33**, Wang and Fye disclose(s) the method of Claim 28, wherein the plurality of characteristics includes a type of the RA group and a description of the plurality of RA partitions (*Fye, figure 2*) and said determining that the data access command pertains to the RA partition is based at least in part on the type of the RA group and the description of the plurality of RA partitions (*Fye, column 2 lines 8-16, column 3 line 53 to column 4 line 14*).
29. As per **Claim 34**, Wang and Fye disclose(s) the method of Claim 33, wherein the type is a stripe and the plurality of characteristics further includes a length of the stripe (*Wang, column 9 lines 32-35, Fye, figure 2*).
30. As per **Claim 35**, Wang and Fye disclose(s) the method of Claim 28, wherein the plurality of characteristics includes a parity rule (*Wang, RAID level includes parity, col. 9 lines 32-42*).
31. As per **Claim 36**, Wang and Fye disclose(s) a machine-accessible storage medium having instructions, which, then executed, results in the machine: providing a root partition (*Fye,*

figure 2) on a storage medium, the root partition defining a plurality of characteristics of a redundant array (RA) group that includes a plurality of RA partitions (*RAID volumes, figure 5, column 8 lines 42-54*), providing a RA partition on the storage medium, the RA partition being one of the plurality of RA partitions, receiving, via a network interface, a data access command multicast to the plurality of RA partitions (*Wang, column 8 lines 42-54, Fye, column 2 lines 8-16*), and determining that the data access command pertains to the RA partition based at least in part on the plurality of characteristics (*Fye, column 2 lines 8-16, figure 2*).

32. As per Claim 37, Wang and Fye disclose(s) the machine-accessible storage medium of Claim 36, wherein the instructions, when executed, further results in the machine: receiving, via the network interface, one or more commands from a host; and providing the root partition and the RA partition based at least in part on the received one or more commands (*Wang, servicing the read request to the parent controller, column 8 lines 56-64*).

33. As per Claim 38, Wang and Fye disclose(s) the machine-accessible storage medium of Claim 36, wherein the plurality of characteristics includes a multicast set associated with the RA group (*Wang, column 9 lines 32-42*).

34. As per Claim 39, Wang and Fye disclose(s) the machine-accessible storage medium of Claim 36, wherein the data access command is multicast to the plurality of RA partitions using an Internet Protocol address (*Wang, column 8 lines 31-41*).

35. As per Claim 44, Wang and Fye disclose(s) the method of Claim 28, further comprising: receiving, via the network interface, one or more commands from a host; and providing the root partition and the RA partition based at least in part on the received one or more commands (*Wang, servicing the read request to the parent controller, column 8 lines 56-64*).

III. CLOSING COMMENTS

36. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

a. STATUS OF CLAIMS IN THE APPLICATION

37. The following is a summary of the treatment and status of all claims in the application as recommended by M.P.E.P. ' 707.07(i):

a(1). CLAIMS NO LONGER IN THE APPLICATION

38. Claims 1-16, 29 and 42 were cancelled by amendment.

a(4). CLAIMS REJECTED IN THE APPLICATION

39. Per the instant office action, Claims 17-28, 30-41, 43 and 44 have received an action on the merits and are subject of a final action.

b. DIRECTION OF FUTURE CORRESPONDENCES

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Dillon whose telephone number is 571-272-8010. The examiner can normally be reached on 9:30-6:00.

41. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on 571-272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

IMPORTANT NOTE

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sanjiv Shah/
Supervisory Patent Examiner, Art Unit 2185

Sam Dillon
Examiner
Art Unit 2185